
REPORT

1835


ON THE

SANDY AND BEAVER CANAL.

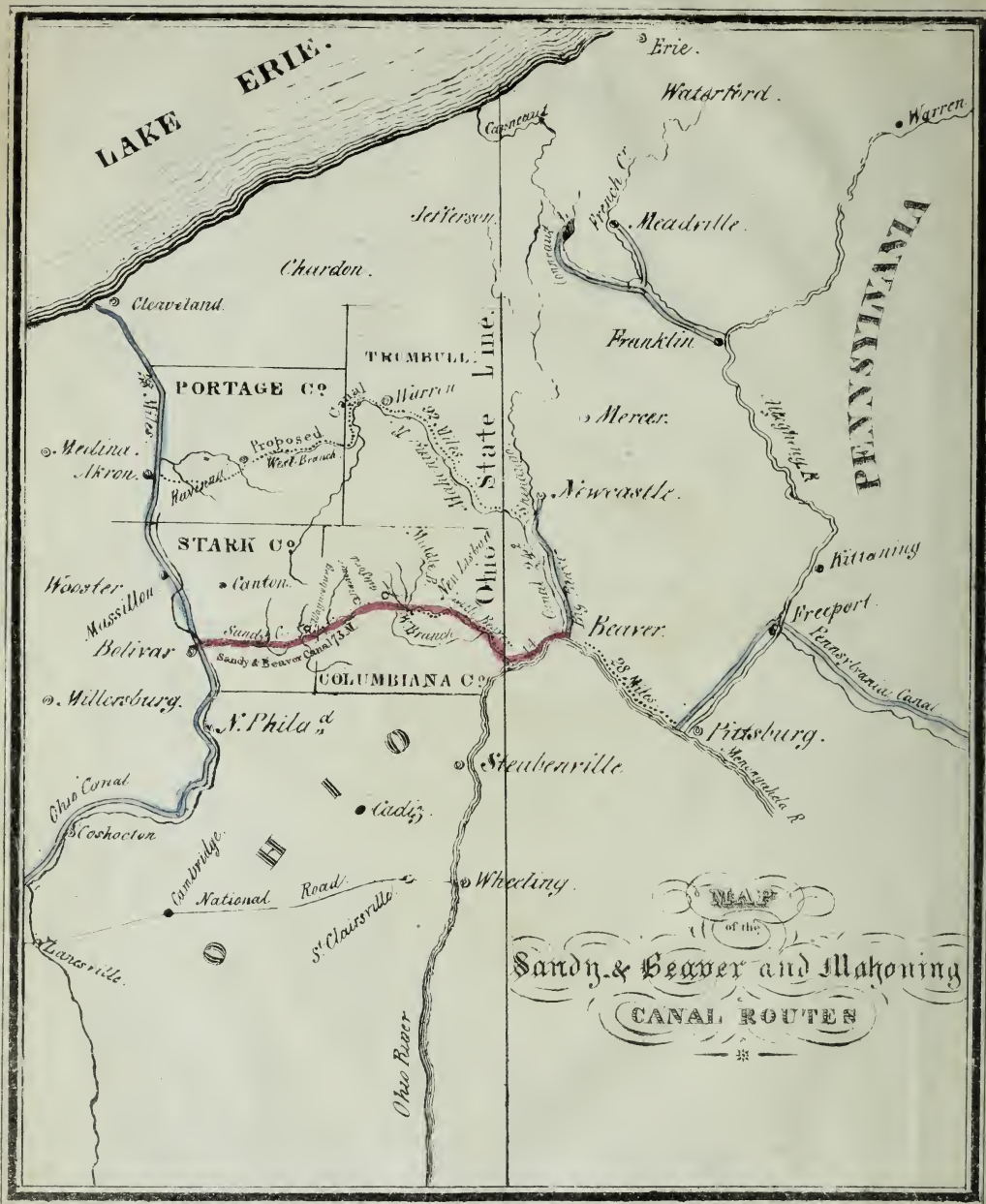
—
WITH A MAP OF THE ROUTE.
—

BY E. H. GILL, ENGINEER.





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1835.



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REPORT.

TO THE PRESIDENT AND DIRECTORS OF
THE SANDY AND BEAVER CANAL CO.

GENTLEMEN:

In compliance with your request I have the honour to lay before you the following Report of the present state of the work under my direction:—

During the past summer the whole line has been minutely traced, with a view to a permanent location: by this survey the total extent of canal has been reduced 3 miles, or the distance from the Ohio river at the mouth of Little Beaver creek to the western termination at the Ohio canal, by the recent examination and location will not exceed $73\frac{1}{2}$ miles.

The Eastern division of the canal, extending from the Ohio river to a point 2 miles west of New Lisbon, embraces a distance of about 27 miles, of which 17 miles are "slackwater:" for this description of improvement the stream is exceedingly well adapted, the valley being narrow and the banks bold and prominent, affording numerous and eligible sites for the locks and dams, and an abundance of good materials for their formation.

The summit or Middle division is about $14\frac{1}{2}$ miles in extent, and the Western division, terminating at the Ohio canal, about 32 miles. The latter division extends through a country affording the greatest facilities for constructing a cheap and permanent improvement; the valley of the creek is broad and has nearly a uniform declivity from its source to its confluence with the Tuscarawas. On the Eastern division the lockage is 464 feet, and on the Western 205, constituting in all 669 feet. In locating the Western division the level has been kept up from Williams' mill dam to the debouch into the Ohio canal at the flourishing town of Bolivar, by which arrangement an

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excellent water power is secured to the Company, affording a head and fall of 26 feet: the owners of the property at the site selected for using the water have liberally ceded to the Company 10 acres of very valuable land for that purpose. Sandy Creek at that point will yield a sufficiency of water, independent of the requisite supply for the canal, *at all times to work 20, and for eight months in the year 50 pair of mill stones.* This power may reasonably be estimated as worth \$6000 per annum. Many other valuable sites for hydraulic purposes have been created or purchased along the route, which, in conjunction with the one above mentioned, will probably afford the Company a revenue of \$7000 per year.

On the Eastern division of the line, 49 sections, or $24\frac{1}{2}$ miles of canal, 13 dams, and 46 locks, are now under contract: on the Middle division, 21 sections or 11 miles, including the tunnels and the reservoir mounds on the west fork of Little Beaver Creek and Cold Run: and on the Western division 28 sections or 14 miles, 11 locks, 1 dam, and the aqueduct over the Tuscarawas river, constituting in all $49\frac{1}{2}$ miles of canal, 14 dams, 57 locks, one aqueduct, and two reservoir mounds now under contract.

The work has been prosecuted in most cases with energy, and is now in a greater state of forwardness than could reasonably have been anticipated, considering that the season was far advanced when it was commenced. About 34 sections or 17 miles of canal are now completed, and likewise the mason work of two locks, and 144,000 cubic yards of excavation removed from the summit deep cuts: dam No. 2, on the Western division, will probably be completed next week.

The foundation of 5 other locks and 2 dams are laid, and 1500 perches of wall built; and a large quantity of stones and other materials for the construction of locks and dams are prepared and on the ground; and I have no doubt all the work now under contract, excepting the tunnels and aqueduct, will be finished in the approaching year.

The work placed under contract is in most instances in the hands of responsible and efficient men, and has been taken on terms exceedingly favourable to the Company. There is at the present period on the line a force equivalent to 2160 men. The cost of the locks, which are built in the most durable manner of cut sandstone, will not exceed \$700 per foot lift, being about thirty per cent. below the ordinary cost elsewhere. The cost of the dams, which are in most instances 14 feet high, will average about \$28 per foot linear across the stream; and

the canal, exclusive of locks and dams, generally from \$3000 to \$5000 per mile.

A contract has been entered into for furnishing the remainder of the hydraulic cement; it is found in abundance contiguous to the line; the quality is equal to any I have seen, and the cost extremely moderate.

The contract for excavating the tunnel and approaches, has been taken by energetic and persevering contractors on reasonable terms, the former not exceeding the estimated cost: this work is to be completed by May 1837. As much has been stated in relation to the adequacy of the supply of water on the summit, it may be proper to remark, that during the past season I commenced and have continued a series of minute examinations of the most prominent streams relied on for a supply: those examinations have thus far fully corroborated the truth of the statements and calculations embraced in the report made you last autumn by Mr. Hage and myself. I feel fully satisfied, that with the aid of the reservoirs that can be constructed on the summit, at a moderate cost compared with their utility, a much larger quantity of water may be introduced into the summit and its dependent levels, than will be requisite for the transit of the immense trade that is destined to seek a market through its channel. The reservoirs now under contract will contain as follows: West Fork reservoir, 130,000,000 of cubic feet; area, 350 acres: Cold Run reservoir, 88,000,000 of cubic feet; area, 250 acres: in addition to which it is proposed to elevate the banks of the canal so as to retain one foot in depth of available water, and flood several pieces of low ground on its northern or upper side, amounting in all to about 150 acres, which, when full, will furnish about 6,500,000 of cubic feet, making in the aggregate from these sources alone, an available supply of 224,500,000 cubic feet of water, a demand on which *may* be requisite in a dry season for a period of 100 days. By calculation it will be perceived, these reservoirs will afford for that period 2,245,000 cubic feet of water per day, equivalent to a discharge of 1559 cubic feet per minute. If to this sum is added the minimum natural flow of water on the summit as reported to you last autumn, (558 cubic feet per minute) it will be observed that the flow of available water in a dry period will amount to 2117 cubic feet per minute, or sufficient, after deducting all that the nature of the soil and climate will require for leakage, filtration and evaporation, for the passage of 185 *boats per day*. The West Fork and Cold Run reservoirs are about one mile apart: when filled,

the surface of the water in each will occupy the same plane, or be elevated to the same height: it is designed to have a feeder extending from one to the other, so that the surplus water in one can be admitted into the other, if required. A large waste weir is to be constructed on this feeder for the purpose of discharging the waste water when both reservoirs are full. This water, when thus discharged, is conducted into the reservoir on the summit level. The two first mentioned reservoirs will receive the drainage of 24 square miles of country; the summit, *the drainage of 80 square miles*. The usual depth of rain that falls in this section of country can, I am informed, with safety be premised at 36 inches per annum, or equal to a column of that height, being 83,635,000 cubic feet on a square mile, and on 24 square miles 2,107,244,800 cubic feet annually. From experiments made on a large scale elsewhere for practical purposes it has been ascertained conclusively, that 75 per cent. of the rain that falls can be laid up in reservoirs. From this data it will be observed, that the three reservoirs above alluded to may be filled seven times per year. This exhibit will probably satisfy the most sceptical as to the adequacy of the supply of water. As to the immensity of the trade that will wend its way through the Sandy and Beaver canal to an Eastern market, I believe there has never been surmised a doubt: a glance at the map will prove conclusively that a very large portion of the produce of Michigan, Illinois, Indiana, Kentucky and Ohio, which are rapidly increasing in population and wealth, must be wafted through it. The business of that section of country is now to a great extent accommodated by the New York improvements, but the completion of the Sandy and Beaver canal will secure to it a safer transit to and from the seaboard, much shorter, and *navigable six weeks earlier in the spring and three later in the fall* than the one now traversed, being sufficient inducements to secure it. What the extent of that trade will be time alone can develope. On the Erie and Champlain canals, a very large portion of the business done on the first of which is derived from the country above mentioned, there have been received in tolls in 1829 \$759,055, 1830 \$1,032,476, 1831 \$1,194,610, 1832 \$1,196,008, 1833 \$1,324,421, 1834 \$1,292,955, and there is no doubt that the business of this year will very greatly exceed the last. On the Ohio canal there was collected in 1832 \$82,867, 1833 \$136,920, 1834 \$151,287, and the amount of tolls received the present year at some of the collectors' offices exhibits an increase of forty-five per cent. over the last.

When the canal or rail road authorized by an act of the legislature of this State at their last session, to be constructed from the western termination of the Sandy and Beaver canal to the Miami canal near the mouth of the Auglaise river shall have been completed, it must add an immense revenue to your work, as it, in connexion with the Wabash and Erie canal through Indiana, and the contemplated rail road through Illinois to the Mississippi river will constitute a continuous chain of internal improvement, extending westerly from the Sandy and Beaver canal 500 miles, and from Philadelphia 1000, into the rich and fertile regions of the west.

The following synopsis of the distance the trade of the country situated west and south-west of the Sandy and Beaver canal would have to travel from the western termination of that work, in order to reach a market by the various routes now afforded it, or about to be, will fully justify the conclusion that it must seek a passage through it.

Distance by the Ohio Canal, Lake Erie, New York Canal and Hudson River to New York.

From the Sandy and Beaver canal to Cleveland	80 miles.
From Cleveland to Buffalo - - - -	200 "
From Buffalo to New York - - - -	515 "
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Total	795 "

Distance by the Ohio and Mahoning Canals and Pennsylvania Canal and Rail Road to Philadelphia.

From Bolivar to Akron - - - -	42 miles.
From Akron to Beavertown - - - -	114 "
From Beavertown to Pittsburg - - - -	28 "
From Pittsburg to Philadelphia - - - -	394 "
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Total	578 miles.

Distance by the Sandy and Beaver Canal and Pennsylvania improvements to Philadelphia.

From Bolivar to Beavertown - - - -	87½ miles.
From Beavertown to Pittsburg - - - -	28 "
From Pittsburg to Philadelphia - - - -	394 "
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Total	509½ miles.

From the rapid increase in business on the New York and Ohio canals it is to be presumed that when the Sandy and Beaver canal shall have been finished, the tolls on the Ohio canal will at least amount to \$400,000 per annum; and from the foregoing facts and statements it is to be inferred, that two-thirds of that trade will pass through the Sandy and Beaver canal, which would neat the holders of stock in that work, at the rate charged on the Ohio canal, an income of at least \$60,000 the first season.* If to this sum is added the amount that may be anticipated from the liberal grant contained in the amended charter,† which cannot fall short of \$150,000, the Company will receive, in the first year after the work is finished, \$210,000 in tolls—independent of the large business that may be expected from the country west and north-west of the termination of their work—presenting the novel result of a canal yielding seventeen per cent. on its entire cost the first year after its completion.

All which is respectfully submitted.

E. H. GILL, CHIEF ENGINEER
S. and B. Canal Co.

NEW LISBON, Ohio, Nov. 11, 1835.

* This estimate may seem large, but it must be kept in mind that the Sandy and Beaver canal will constitute a connecting link between two large and important works, (the Ohio canal and Pennsylvania improvements) now completed; consequently it has not, like other canals, to await the growth of business.

† The amended charter secures to the Sandy and Beaver Canal Co. all the tolls collected on the Ohio canal from boats that have passed through the Sandy and Beaver canal for seven years after its completion.



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